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Claims

[c1] 1. An apparatus for positioning a transport system and a load port, comprising:
a signal emitting unit disposed on one of the transport system and the load port; and
a positioning board disposed on the other of the transport system and the load port;
wherein the signal emitting unit has two positioning points thereon capable of emitting two light beams to the positioning board;
the positioning board has two holes at two positions corresponding to the two positioning points, such that the two holes are vertically aligned with the two positioning points when the positioning board is horizontal and is aligned with the load port; and
the two light beams can pass through the two holes perpendicular to the positioning board in a horizontal state when the load port is aligned with the transport system.

[c2] 2.The apparatus of claim 1, wherein the two light beams comprise two laser beams.

[c3] 3.The apparatus of claim 1, wherein the positioning board has coordination axes thereon passing the two

holes.

[c4] 4. The apparatus of claim 1, wherein the positioning board further includes at least one beam monitoring device for monitoring collimation of at least one of the two light beams passing through the two holes.

[c5] 5.The apparatus of claim 4, wherein the beam monitoring device includes a light projection board and a reflecting mirror, while the light beam is reflected to the light projection board via the reflecting mirror.

[c6] 6.The apparatus of claim 1, wherein the positioning board further includes a leveler.

[c7] 7. The apparatus of claim 1, wherein the positioning board is disposed below the signal emitting unit.

[c8] 8.The apparatus of claim 1, wherein the signal emitting unit is a front opening unified pod (FOUP) for positioning disposed on the transport system, and the signal emitting unit emits the two light beams from a bottom thereof to the positioning board disposed below the signal emitting unit.

[c9] 9. A positioning apparatus, comprising:
a signal generating unit, disposed on one of two objects to be positioned; and

a positioning unit, disposed on the other of the two objects to be positioned,

wherein the signal generating unit has two positioning points thereon capable of emitting two light beams to the positioning unit;

the positioning unit has two holes at two specific positions; and

each of the two light beams can pass through one of the two holes in a specific direction when the two objects are aligned with each other.

[c10] 10. The positioning apparatus of claim 9, wherein the positioning unit has a planar top surface and the two light beams pass through the two holes perpendicular to the planar top surface when the two objects are aligned with each other.

[c11] 11. The positioning apparatus of claim 10, wherein the planar top surface has coordination axes thereon passing the two holes.

[c12] 12. The positioning apparatus of claim 10, wherein the positioning unit further includes a leveler.

[c13] 13. The positioning apparatus of claim 9, wherein the two light beams comprise two laser beams.

[c14] 14. The positioning apparatus of claim 9, wherein the

positioning unit further includes at least one beam monitoring device for monitoring a direction of at least one of the two light beams passing through the two holes.

[c15] 15. The positioning apparatus of claim 14, wherein the beam monitoring device includes a light projection board and a reflecting mirror, while the light beam is reflected to the light projection board via the reflecting mirror.

[c16] 16. A positioning method for directly positioning a load port and a transport system, comprising:
(a) disposing a positioning board on the load port, the positioning board having two holes thereon;
(b) disposing a signal emitting unit on the transport system, wherein the signal emitting unit has two positioning points thereon capable of emitting two light beams to the positioning board, and positions of the two positioning points correspond to positions of the two holes;
(c) setting the positioning board to be horizontal;
(d) making the signal emitting unit emit two light beams to the positioning board, wherein the two light beams are set to be perpendicular to a surface of the positioning board;
(e) obtaining a translational deviation and a rotational deviation of the load port based on positions of two light spots on the positioning board generated from the two light beams relative to the two holes; and

(f) adjusting the load port according to the translational deviation and the rotational deviation, until the two light beams can pass through the two holes.

[c17] 17. The method of claim 16, wherein the step of setting the positioning board to be horizontal includes using a leveler to adjust the load port.

[c18] 18. The method of claim 16, wherein the positioning board further includes at least one beam monitoring device, the method further comprising:
(g) using the at least one beam monitoring device to monitor collimation of at least one of the two light beams passing through the two holes and adjusting a direction of the light beam according to the monitor result; and
repeating the steps (e) and (f) and then observing whether the two light beams pass through the two holes perpendicular to the positioning board or not; if the two light beams pass through the two holes perpendicular to the positioning board, the load port is aligned with the transport system; otherwise, repeating the steps (g), (e) and (f) until the two light beams can pass through the two holes perpendicular to the positioning board.

[c19] 19. The method of claim 18, wherein the beam monitoring device includes a light projection board and a re-

flecting mirror, wherein the light beam is reflected to the light projection board via the reflecting mirror.

[c20] 20. The method of claim 19, wherein the step of monitoring collimation of the light beam is based on variation of a position where the light beam is projected on the light projection board.